International Journal of Community Medicine and Public Health
Elzahaf RA et al. Int J Community Med Public Health. 2016 Jul;3(7):1915-1920
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20162065

Research Article

Prevalence of anaemia among pregnant women in Derna city, Libya

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Received: 22 May 2016
Accepted: 13 June 2016

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ABSTRACT

Background: Anemia is considered a major public health problem; playing an important contributor to mortality and morbidity among pregnant women globally, especially in developing countries. This study was conducted to estimate the prevalence of anemia among pregnant women in Derna, Libya.
Methods: A cross sectional study was conducted on 595 pregnant women randomly selected attending the antenatal clinic in the primary health centre in Derna city, Libya. Data was collected using a questionnaire to collect data about socio-demographic characteristics and obstetric history.
Results: The prevalence of anaemia among pregnant women was 54.6% (95% CI, 51.45% -57.75%) of with 44.5% mild anaemia. The higher prevalence of anaemia was in the third trimester of pregnancy (59.6%). Anaemia was more prevalent in pregnant women within age between 15-20 and 36-40 years and with a primary-level education. However, the prevalence of anaemia was not significant associated with socio-demographic factor, parity and gravidity.
Conclusions: The prevalence of anaemia among pregnant women in Libya is comparable to that considered as a severe public by WHO suggesting those anaemia among pregnant women is a public health problem in Libya. So, awareness regarding balanced diet, regular antenatal checkups, regular intake of iron and folic acid tablet is highly recommended.

Keywords: Anaemia, Derna, Libya, Pregnant women, Prevalence

INTRODUCTION

Anemia is considered a major public health problem; playing an important contributor to mortality and morbidity among pregnant women globally, especially in developing countries.[1]

Physiologically, during pregnancy there is an increase of iron and folate requirements, therefore the possibility of decreased iron and folate is high if there is not supplementation. [2] Early detection and effective management of anaemia in pregnancy would add to planning appropriate strategies aimed at reducing the burden of maternal morbidity and mortality. Anemia in pregnancy is associated with a reduced oxygen delivery to the fetus, subsequently causing intrauterine growth retardation, stillbirth, low birth weight, neonatal deaths, preterm birth, and consequent impaired growth and cognition of the child.[3,4]

Furthermore, infants of anemic women are born with reduced iron stores and are at risk of anemia during infancy and increased risk of infant morbidity and mortality thereafter.[5,6] In developing countries, the main cause of anaemia during pregnancy is nutritional deficiencies of iron, folate, and vitamin B12 and also

parasitic diseases, such as malaria and hookworm.[6,7] Women with sever anemia have lower ability of enduring moderate blood loss during labor, which makes them at higher risk of requiring blood transfusion.[8] Furthermore, the mother with severe anemia may have increased the risks of cardiac failure or death from peripartum hemorrhage.[2] Therefore, reduction of anemia during pregnancy is therefore a key component of safe motherhood and childhood.[9]

In 2011 the World Health Organization (WHO) estimates the prevalence of anaemia in pregnant women worldwide as 38.2% (95% CI: 33.5-42.6) and in South-East Asia, Eastern Mediterranean and African Regions range from 38.9% to 48.7%.[1] In addition, African and Asian Regions appear to be the main affected regions worldwide, accounting for 46.3 % in Africa and 48.7% in South-East Asia. Followed by 25.8% in Europe and 24.9% in America Regions.[1]

A number of studies on the epidemiology of anaemia in Africa; have shown different prevalence figures of anaemia. For example, in Nigeria 54.5%, in Ethiopia 56.8% and in Kenya 57%.[10-12]

In addition, there has been few research on the epidemiology of anaemia in pregnancy in Arab countries, range from 25% in Kuwait to 40% in Saudi Arabia.[1] It appears that almost third of pregnant women in several Arab countries suffer from anemia, in Egypt 30% of pregnant women are affected, 31% in Iraq, Morocco 32% Qatar 28 %, Saudi Arabia 40%, Tunisia 29% and United Arab Emirates 26%.[1]

Limited data are available in Libya, especially in different cities and regions, WHO in 2011 estimated that 28% of pregnant women in Libya suffer from anemia; a figure lower than previously estimated in 2005(34%).[1] So, the purpose of this study is to estimate the prevalence of anemia in pregnant women with its associated factors in Derna city in Libya.

METHODS

A cross-sectional face-to-face interview was used to gathered data from 01 June 2015 to 30 December 2015. The number of pregnant women required to be screen from study population was calculated according to Raosoft software.

The assumptions were: there is 95% power at the 5% significant level to find a 40 % prevalence of anemia, considering that there was no known study on the prevalence of anaemia amongst pregnant women in a primary health centre conducted in Libya. It was therefore calculated that a minimum sample size of 575 pregnant women would provide an estimate of prevalence with 4% error. However, this minimum sample size was increased to 595 participants to improve the precision of the study.

Patients' selection

All pregnant women attending the antenatal clinic in the primary health centre were enrolled in the study. The role of antenatal clinic in Libya that the pregnant women should attend the clinical at least 3 times during the pregnancy period for clinical examination and ask for routine medical tests each trimester which including the haemoglobin level.

Procedure

Data was collected from pregnant women by questionnaires administered by the physician. Their names were not required on the questionnaire and each subject was assured that the information given was only for scientific purposes and would be kept confidential. Information on the questionnaire included socio-demographic characteristics such as age, occupation and educational status. Haemoglobin level was obtained from the last result reordered in patients file.

Anaemia in this study is defined by using the WHO criteria of haemoglobin values of less than 11g/dL.[13]

- Mild anaemia 9.0-10.9g/Dl
- Moderate anaemia 7.0-8.9g/dL
- severe anaemia <7.0 g/dL

Statistical analysis

Data analysis was performed using SPSS software version 20. Descriptive statistics, including percentage, mean, range, and standard deviations, were calculated for all variables. Proportions were compared using Chi-square tests and *P*-value less than 0.05 was considered statistically significant. Logistic regression analysis was performed to estimate the association between the potential risk factors and anaemia among pregnant women.

RESULTS

Five hundred and ninety five (595) pregnant women were included in the study. The ages of the pregnant women ranged from 15 to 48 years with a mean age of 30.3±6.2 years. Most of pregnant women had completed a secondary-level education (59.8%) and (73.6%) were from the middle socio-economic class (Table1). The mean Hgb level of pregnant women was 10.63±1.43 g/dL (range: 6.00-14.00 g/dL) and the overall prevalence of anaemia among pregnant women was found to be 54.6% (95% CI, 51.45%-57.75%).

The prevalence of mild, moderate, severe anaemia were observed as 44.5%, 7.6%, and 2.5%, respectively. Thus the prevalence of mild anaemia was high in comparison to the other degrees of anaemia. Anaemia was observed to be more prevalent in pregnant women within age between 15-20 and 36-40 years. While age ≥41 had 1.58

times (OR=1.58; 95% CI=0.58-4.31; P=0.37) more likely to be anaemic than other age group. The association between age and anaemia in pregnancy was, however, not statistically significant (χ^2 = 4.082, p = 0.54) (Table 1).

Table 1: Sociodemographic characteristics of pregnant women and prevalence of anemia (n = 595).

Women characteristics	N (%)	Anemia	Non-anemia	Prevalence of anemia%	OR (95%CI)	P
Age						
15-20	31 (5.2)	19	12	61.3		
21-25	112 (18.8)	61	51	54.5	1.32 (0.58-2.98)	0.54
26-30	203 (34.1)	103	100	50.7	1.54 (0.71-3.33)	0.27
31-35	125 (21.0)	69	56	55.2	1.28 (0.57-2.87)	0.54
36-40	92 (15.5)	57	35	62.0	0.97 (0.42-2.24)	0.94
≥41	32 (5.4)	16	16	50.0	1.58 (0.58-4.31)	0.37
Education						
Primary	37 (6.2)	23	14	62.2		
Secondary	356 (59.8)	182	174	51.1	1.57 (0.78-3.15)	0.20
University degree	194 (32.6)	116	78	59.8	1.11 (0.54-2.27)	0.78
Postgraduate degree	8 (1.3)	4	4	50.0	1.64 (0.35-7.64)	0.52
Occupation						
Housewife	266 (44.7)	145	121	54.5		
Employed	291(48.9)	162	129	55.7	0.95 (0.68-1.33)	0.78
Business	20 (3.4)	11	9	55.0	0.98 (0.39-2.44)	0.96
Student	18 (3.0)	7	11	38.9	1.88 (0.70-5.00)	0.20
Family income						
Low	55 (9.2)	31	24	56.4		
Middle	438 (73.6)	235	203	53.7	1.12 (0.63-1.96)	0.71
High	102 (17.1)	59	43	57.8	0.94 (0.48-1.82)	0.86

Table 2: The prevalence of anemia according to the obstetrics and medical factors (n = 595).

Variables	No (%)	Anemia	Non-anemia	Prevalence %	OR (95%CI)	*P*
Gravidity						
Primigravidae	154 (25.9)	76	78	49.4		
Multipara	441 (74.1)	249	192	56.5	1.33 (0.92-1.92)	0.13
Gestational age						
1st trimester	164 (27.6)	82	82	50.0		
2nd trimester	208 (35.0)	110	98	52.9	0.89 (0.59-1.34)	0.58
3rd trimester	223 (27.5)	133	90	59.6	0.67 (0.45-1.01)	0.06
Parity						
0-1	331 (55.6)	176	155	53.2		
2-3	145 (24.4)	75	70	51.7	1.60 (0.71-1.56)	0.77
≥4	119 (20.0)	74	45	62.2	0.96 (0.45-1.06)	0.09

The mean ages of anaemic and non-anaemic pregnant women were similar, 30.37 and 30.22 years respectively. The prevalence of anaemia was highest amongst pregnant women with a primary-level education (62.2%) (OR=1.57; 95% CI= 0.78-3.15; P=0.20). This relationship between the prevalence of anaemia and the level of education of pregnant women was not statistically significant (χ2 = 4.76, p = 0.190) (Table 1).

Anaemia was also found to be more prevalent amongst housewife (54.5%) followed by employed (55.70%) and businesswomen (55.00%) than students, but this relationship was not statistically significant (χ^2 = 1.92, p = 0.587). However, students had 1.88 times (OR=1.88; 95% CI= 0.70-5.00; p=0.20) more likely to be anaemic than other groups (Table 1). The family monthly income for anaemic and non-anaemic women was similar (χ^2 = 0.66, p = 0.72). However, the middle income had 1.12

times (OR=1.12; 95% CI=0.63-1.96; P=0.71) more likely to be anaemic (Table 1). Concerning obstetrical history, 74.1% were multigravida, 55.6% of the study women were parity from 0-1. The prevalence of anaemia was found more in multigravida (56.5%) with 1.33 times more likely to be anaemic than primigravidae (OR=1.33; 95% CI=0.92-1.92; P=0.13) and in women with more than 2 parity (Table 2).

Overall mean gestational age was 20.86±10.43 weeks ranged from 12 weeks to 43 weeks. The majority was in the third trimester (35.0%). Anaemia was found to be more prevalent in women during the third trimester (59.6%) (Table 2). The anaemic condition among different age groups shows to have no significance as the moderate and severe anaemic condition seem to have almost the similar values with little variation but mild anaemia was higher in all age groups (Table 3).

However, among the gestation age, there was no different between the distribution of anaemia in sever and moderate anaemia in gestational age while the heights percentage in mild anaemia in third trimester (49.8%) (Table 4).

Table 3: Distribution of anaemia in pregnant women according to age (n = 595).

Age (years)	Sever (%)	Moderate (%)	Mild (%)	Normal (%)	Total
15-20	1 (3.2)	1 (3.2)	17 (54.8)	12 (38.7)	31
21-25	1 (0.9)	7 (6.3)	53 (47.3)	51 (45.5)	112
26-30	5 (2.5)	19 (9.4)	79 (38.9)	100 (49.3)	203
31-35	1 (0.8)	8 (6.4)	60 (48.0)	56 (44.8)	125
36-40	6 (6.5)	8 (8.7)	43 (46.7)	35 (38.0)	92
≥41	1 (3.1)	2 (6.3)	13 (40.6)	16 (50.0)	32

Table 4: Distribution of anaemia in pregnant women according to Gestational age (n = 595).

Gestational age	Sever (%)	Moderate (%)	Mild (%)	Normal (%)	Total (%)
1st trimester	5 (3.0)	14 (8.5)	63 (38.4)	82 (50.0)	164
2nd trimester	5 (2.4)	14 (6.7)	91 (43.8)	98 (47.1)	208
3rd trimester	5 (2.2)	17 (7.6)	111 (49.8)	90 (40.4)	223

DISCUSSION

This data was gathered from pregnant women from Derna City/ Libya. Libya is classified as a developing country with an HDI of 0.784 and Libya estimate of prevalence was higher and lower than other studies estimated.[14] There is a consensus in the literature that anaemia is a common problem in pregnant women in most of developing countries.

The preliminary estimate of prevalence of anaemia in Derna was 54.6% (95% CI, 51.45%-57.75%) using WHO criteria, anaemia in pregnant women is when the haemoglobin concentration in the blood less than 11.0 g/dl. Furthermore, anaemia considered as a severe public health problem among pregnant women when the prevalence is 40.0% and more by WHO.[1] The prevalence of anaemia is high in this study, however, 44.5% had mild anaemia which Hb level ranged from (9-10 g/dl), 7.6% had moderate anaemia (Hb 7.0-8.9 g/dl) and 2.5% had severe anaemia (Hb<7.0 g/dl). This was lower than what found in pregnant women in Gondar, were (64%) mild type and (52.73%) and (60%) in India.[15-17]

The prevalence estimate of anaemia in Derna / Libya was higher to the overall prevalence of anaemia among pregnant women in the world which was 38.2% and a slight similar to the overall prevalence among pregnant women in Africa, 44.6%.[1] Nevertheless, Derna's estimate is within a range of the prevalence in some Africa countries for example in Nigeria was 54.5%[10], Ethiopia was 56.8%, Kenya was 57%.[11,12] And lower compared with what was obtained in similar studies conducted in Nigeria (62.6%) and (62.2%) in Egypt.[18,19] And lower in women attended to antenatal clinic at hospital of Potro Novo-Cape Verde, Benin 38.8% and in other two studies in Nigeria 23.2% and 29%, 16.6% in Northwest Ethiopia.[15,20-22]

Interestingly, this finding is higher to the overall prevalence found among pregnant women than other studies in the Middle East and North Africa, 40.08 % in Algeria, 26.2% in Bahraini, 27.1% in East Anatolian Province, Turkey, Jordan (34.7%) and (39%) in Makkah, Saudi Arabia.[23-27] There are many reasons to explain this variation. These variations in the prevalence may be due to different methodology and sampling techniques used, nutritional habits and characteristics of the target population.

The mean age group of pregnant women was 30.3±6.2 (15-48) years. Severe anaemic condition is seen among

the pregnant women with age group between 36-40 years representing 6.5% followed by 2.5% severity among the age group 26-30. Pregnant women aged 41 years and above were about 1.58 times more likely to be anaemic compared to those aged 15-20 years. This was similar to other studies.[5,28] The age of the pregnant women was not significantly associated with anaemia. This is similar to other study.[23]

No significant association was found between anaemia and educational levels. This is in accordance with Jordan and Nigeria study.[18,26] However, the prevalence of anaemia in this study was higher amongst pregnant women with primary education this is similar to findings in a study by Taner et al in Turkey, in Bahrain by Merza et al, in India by Lokare et al and in Nigeria by Ndukwu and Dienye.[5,18,24,28] The lower level of anaemia among women with primary education might due to the less awareness regarding to anaemia and consequences of anaemia.

Most of the women were employed 291 (48.9%). 162 (55.7%) of them were suffering from anaemia. This is in accordance with India study.[29] However, students were 1.88 times more likely to had anaemia than others. This may be because of the lower sample size of this group. Socio-economic status is known as one of the important factors of anaemia. Interestingly, in this study was not significant different between socio-economic classes and anaemia which similar to other study.[26,30] This appears to be at variance with other studies in which it is expected to be more in the lesser socio-economic class more prevalent.[5,18]

The results in our study showed that 62% of pregnancies with parity more than 4 have anemia than other parity. This similar to other studies.[24,26-28] Pregnant women with Multipara were 1.33 times more likely to had anaemia than primigravidae but not statically significant. This is was similar to other study.[31] The lower level of anaemia among women with Multipara might be due to the greater menstrual losses. Multiparity may induce anemia by reducing maternal iron reserves at every pregnancy and by causing blood loss at each delivery.

In present study, anaemia was found to be more prevalent among pregnant women in third trimester (59.6%). This is in accordance to some other studies; in Egypt, Jordan and Saudi Arabia.[15, 18,25,29] This could be attributed to the increased requirements of micronutrients during the last trimester. Present study has some limitations; the data were collected from one urban city in Libya. This means that the results cannot be generalized to a rural population. Also, the absence of stratified sampling technique could introduce some bias in the study.

Literature discovered that tea reduces iron absorption but does not affect iron status in the body.[32] So, the diet of the pregnant women should be investigated. As, most of Libyan population drink tea after the meal which unhealthy habits. Low intake of red meat was associated with anaemia, however, Libyan eat red meat at least 3 times a week. Biochemical tests included measurement of serum iron, ferritin, and total iron binding capacity (TIBC) should be used to classify the types of anaemia.

CONCLUSION

The prevalence of anaemia among pregnant women in Libya is comparable to that considered as a severe public by WHO suggesting those anaemia among pregnant women is public health problem in Libya. So, awareness regarding balanced diet, regular antenatal checkups, regular intake of iron and folic acid tablet, it is highly recommended.

ACKNOWLEDGEMENTS

The authors are grateful for all study participants who took part in the study for their time. We also acknowledge the antenatal clinic in the primary health centre for providing all necessary assistance to carry out the present study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The ministry of health in Derna city and faculty of medical technology approved the study

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Cite this article as: Elzahaf RA, Omar M. Prevalence of anaemia among pregnant women in Derna city, Libya. Int J Community Med Public Health 2016;3:1915-20.